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Remarks

Claims 1-91 are pending in the subject application. Applicants acknowledge that claims 13-51 have been withdrawn from further consideration as being drawn to a non-elected invention. By this Amendment, Applicants have amended claim 1 and added new claims 72-91. Support for the amendments can be found throughout the subject specification and in the claims as originally filed (for example, page 16, lines 11-13; page 17, lines 9-19; and pages 62-69). Entry and consideration of the amendments presented herein is respectfully requested. Accordingly, claims 1-91 are currently before the Examiner. Favorable consideration of the pending claims is respectfully requested.

The Examiner has indicated that the title of the invention is not descriptive and that a new title is required that is clearly indicative of the invention to which the claims are directed. Applicants have amended the title of the invention to "Microfluidic Devices and Uses Thereof in Biochemical Processes." Accordingly, reconsideration and withdrawal of this objection is respectfully requested.

Claims 1-6, 10, 11, 54-62, 64, 65, and 69 are rejected under 35 U.S.C. §102(b) as anticipated by Kopp *et al.* (1998). Applicants respectfully traverse. It is respectfully submitted that Kopp *et al.* fail to anticipate the claimed invention in that the reference fails to teach a device that comprises at least one temperature regulated zone that cycles between at least two different and predetermined temperatures; rather, the reference teaches a device that comprises a plurality of temperature regulated zones that are thermostatted to a single predetermined temperature. It is respectfully submitted that the device of Kopp *et al.* comprises a plurality of temperature regulated zones that are thermostatted at a single predetermined temperature and that "cycling" of these zones around this single predetermined temperature does not anticipate a temperature regulated zone which cycles between at least two different and predetermined temperatures (*e.g.*, two different and predetermined set points such as those recited in newly presented claims 80-87). It is also respectfully submitted that the reference fails to teach those limitations provided with respect to temperature sensors provided in the claimed invention (see, for example, claims 89 and 91). Accordingly, reconsideration and withdrawal of the rejection under 35 U.S.C. §102(b), is respectfully requested.

Claims 1-12, 54-66, and 69-71 are rejected under 35 U.S.C. §102(e) as anticipated by Mastrangelo *et al.* (U.S. Patent No. 6,136,212). Applicants respectfully traverse. It is noted that the Office Action asserts the reference teaches two thermally regulated zones that are: 1) the temperature

cycling means, and 2) a region upstream from the pump which is not heated. However, it is respectfully submitted that Mastrangelo et al. fail to anticipate the claimed invention in that the reference fails to teach a device that comprises a microfluidic substrate comprising at least one sample pathway for sample flow and at least one temperature regulated zone that cycles between at least two different and predetermined temperatures, said at least one temperature regulated zone being adapted to bring at least a portion of said sample pathway to said at least two temperatures while a sample is continuously and/or unidirectionally flowing along said sample pathway and wherein the sample is cycled between said at least two different and predetermined temperatures while in said at least one temperature regulated zone. It is also respectfully submitted that those sections of the reference relied upon in support of the rejection of record fail to teach a temperature regulated zone that brings a sample to at least two different and predetermined temperatures. Rather, the reference teaches thermocompression suction pumps that create a pressure differential between the two sides of the liquid drop in order to move the drop through the device. There is no teaching that such a pump heats the sample in the temperature regulated zone nor is there any teaching that a sample is heated to two different and predetermined temperatures while in the temperature regulated zone; rather, the reference teaches that the heating elements heat air and use the cooling of the air to create a vacuum that provides for the movement of a sample in the device. Additionally, it is respectfully submitted that the reference fails to teach the limitations presented in claims 12, 66, and 72-91. Accordingly, reconsideration and withdrawal of the rejection under 35 U.S.C. §102(e) is respectfully requested.

Claims 7-9, 63, 67, 68, 70, and 71 are rejected under 35 U.S.C. §103(a) as obvious over Kopp et al. (1998) in view of Wilding et al. (U.S. Patent No. 5,498,392). The Office Action indicates that the rejection has been maintained from the previous rejection set forth on June 19, 2002 on the basis that Wilding et al. teaches continuous flow of a sample as set forth in column 10. Particularly, the rejection argues that the sample is continuously cycled when it is moved between sections 22A and 22B. It is respectfully submitted that such movement does not meet the art recognized meaning of "continuously flowing" which Applicants submit is understood to mean the continuous motion of a sample in a single direction. Indeed, the Webster's Dictionary defines continuous as "uninterrupted or unbroken" (see highlighted definition provided for the Examiner's

convenience). Thus, one skilled in the art would have recognized that the sample of the claims flowed in an uninterrupted or unbroken manner through the sample pathway of the claimed device. This is in contrast to the back and forth motion of the sample as taught by Wilding *et al.* which would not be understood to one skilled in the art as a "continuously flowing" sample. In the interest of advancing prosecution, Applicants have also provided additional claims that recite the unidirectional flow of a sample through the claimed device (see, for example, claims 1 and 79-88).

Applicants also respectfully submit that the combination of references fails to establish a prima facie case of obviousness for the claimed invention on the basis that the combination fails to teach each and every limitation of the claimed invention. For example, Kopp et al. fail to teach a device that comprises at least one temperature regulated zone that cycles between at least two different and predetermined temperatures; rather, the reference teaches a device that comprises a plurality of temperature regulated zones that are thermostatted to a single predetermined temperature. Wilding et al. fail to remedy this deficiency and, thus, it is respectfully submitted that a prima facie case of obviousness has not been established for the claimed invention. Further, the combination of references fails to teach the limitations recited in claims related to those temperatures through which the temperature regulated zones cycle (see, for example, claims 73-78 and 80). Accordingly, reconsideration and withdrawal of the rejection under 35 U.S.C. §103(a) is respectfully requested.

It should be understood that the amendments presented herein have been made <u>solely</u> to expedite prosecution of the subject application to completion and should not be construed as an indication of Applicants' agreement with or acquiescence in the Examiner's position. Applicants expressly reserve the right to pursue the invention(s) disclosed in the subject application, including any subject matter canceled or not pursued during prosecution of the subject application, in a related application.

In view of the foregoing remarks and amendments to the claims, Applicants believe that the currently pending claims are in condition for allowance, and such action is respectfully requested.

The Commissioner is hereby authorized to charge any fees under 37 CFR §§1.16 or 1.17 as required by this paper to Deposit Account No. 19-0065.

Applicants invite the Examiner to call the undersigned if clarification is needed on any of this response, or if the Examiner believes a telephonic interview would expedite the prosecution of the subject application to completion.

Respectfully submitted,

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FCE/sl

Attachment: Webster's Dictionary page 305.

WEBSTER'S II New Riverside University Dictionary

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Library of Congress Cataloging in Publication Data Main entry under title:

Webster's II new Riverside university dictionary.

1. English language—Dictionaries. I. Riverside Publishing Company. II. Title: Webster's two new Riverside university dictionary. III. Title: Webster's 2 new Riverside university dictionary.

PE1625.W244 1984 423 83-3799

ISBN: 0-395-33957-X (thumb index, trade edition) 0-395-37928-8 (high school edition)

Manufactured in the United States of America

contained in a recept. ontents Subject me nificance, of a literage ified substance Com

Lat contentus & p.pari Contented : satisfied 1 to be content with ime ente To make conte

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adj:[lat contiguit laring a boundary or o mediately preceding o groofite), conttigu 1. Self-restraint: mo

sexual activity, 3 Volum [lat-(terra) continent asses of the earth/usu lie itralia, Europe, North nent. The European H adj [ME | lat conting | CONTAIN.] Exercising THE PROPERTY OF THE PARTY.

the noun continentant ne noun continue use they were borrow gs. Both word are derived inle of commercy with Continers, which is also atin word and had awade train; hold back; subdit jective appeared in the iple continue iple continents mean of culthe great age of explo ame into use for landing enoted any continuous

also applied to a mainland as distinguished from islands or pen insulas, especially to the European continent in contrast to the Britinities; by the 17th century continent was used to refer to the large indimasses called "continents" today

indimans tal (kön'tə nen'tl) adj. 1: Of, relating to/or like a conin the tangent can be a super of relating to the mainland of European 3. Continental Of or relating to the mainland of European 3. Continental Of or relating to the American open European and immediately after the Revolutionary Was -- n. Continental: An inhabitant of the mainland of Europe: PHOTEAN 2 Continental A soldier in the Continental Army dur in the Revolutionary War. 3: A piece of paper money issued by the

memerican are an in the suboceanic crust.

In weakness in the suboceanic crust. ment extending to a point of steep descent to the ocean floor.

nmine occan notating in the clear 1: at An event that hito the ocean bottom. ment of probable : Possibility by A possibility that he prepared against 2 Dependency on chance: UNCERTAINTY.

ney table n. A statistical table that shows the observed table n:A statistical table that allows the rows indicating one variable and the rows indicating one variable and the rows indicating one variable and the rows in columna another variable; or gricola ciacio avit

http://tichen.com/adj.[MB]<-Lat.comingens.pr.part.of mir 2 Dependent on conditions or events not yet estab-NOTIONAL 3. Happening by accident of chance : PORTU-Possessing a truth value derived from facts apart in properties the proof necessarily true or false: -n+1.4 has been propertied in the proof of th A state of quote, and the continue of quote, and though the continue of the co

Minterrupted : steady. b. Continuous in time: INCES-

minus worry con-the west-ly idv. 201100 in the continuence (kan-tin'yoo-ns) n. D. The act or fact of continuence during which something exists or lasts: DURATION. inimisequeli 4. Law. Postponement of judicial proceed int (kan-in you ont) n. A consonant, as a z-vory, that

drieflong as the dreath lasts without a change in matelon (kentin'yoo a shon) n L a. The act-or fact of

harmestate of being continued 2 An extension by ting is carried to a further point 3. Resumption after an

tive: (kan-tin'yoo-a'tiv, o-tiv) adj. Of, relating to, or tion Con-tinue tive ly adv. 1100 and 1500

actor (lentin you's tar) in One that continues, esp. one nethy(0)) v wed -u-ing -ues [MF continuen <

vi L'To go on with a particular action or conditions PERSIST. 2. To exist over an extended pe-Poremain in the same state, capacity, or place. 4. To nvestigators will continue their surveillance. instime space; or development : EXTEND: 3. To att RETAIN 46 To carry on after an interruption To postpone or adjourn (a judicial proceeding).

de con the wer n Hickim that likewise has a denominator consist-

isation n 1 An educational program that unionidate in a particular area of knowledge or into dite in a particular area of anomalia designed esp. for partitime, adultistical designed esp. for partition esp. for partition adultistical designed esp. for partition esp. for pa

to not te, nyoo') in pl. ties. 1. The quality into ite involvement in the involvement of the invo enfrom shot to shot in a film. b. A script for inidio or television programate in the program place [Ital < Lat. continues conceyboard accompaniment for a solo instru-

thingsth this is a cut dr urge i y young albout item edible, gillop, circus

ment in which numerals indicate the successive chords, the actual notes played being left to the performer was now, a passition, as continuous (kantinyoos) adj. [lat continuus see CON TINUE. J. L. Uninterrupted : unbroken. L. Math. Designating a function of one or more variables in which the variation of its values can

be made arbitrarily small in a sufficiently small neighborhood of every point in a given interval -con-tin'inous ly div. -con-tin'

*: SYMS:: CONTINUOUS; CEASELESS; CONSTANT; CONTINUAL; END LESS, ETERNAL, EVERLASTING, INCESSANT, INTERMINABLE, NONSTOP, PERPETUAL, RECENTLESS, ROUND-THE-CLOCK, TIMELESS, UNCEASING, UNREMITTING add, core meaning sensing of occurring without interruption or end of unitated by their continuous chatter > anti-discontinuous chatter > anti-discon

continuous creation theory n. Steady state theory. continuous spectrum n. A spectrum having no breaks, esp. a spectrum of radiation distributed over an uninterrupted range wavelengths.

continuous wave adj. Emitting or capable of emitting continuously not pulsed. Used esp. of lasers.

continuum (kantin'yoo m) n. pl. tinua (tin'yoo o) or tinuum [Lat, neuter of continuus, continuous] 1. A continuous extent, succession or whole no part of which can be distinuated to the continuous of the can be distinued to the continuous extent, succession or whole no part of which can be distinued to the continuous extent. guished from neighboring parts except by arbitrary division. 2 Math.

con-tort (ken-tort) v. sorted corting torts. [Lat con-torquere, contort, to twist com- (intensive) + torquere, to twist] VE To twist severely out of shape : WRENCH ... VI To become twisted into a forced expression or shape. —con-tor-closs nitor tive adj.

con-torted (kan tor tid) adj. 1. Twisted or wrenched out of shape. 2. Bon Twisted or bent upon itself. —con-tort edity day. —con-tort edity and tort ediness it.

con-tor-tion-ist (kon-thi-sho-nist) no An acrobat who exhibits extraordinary bedily positions. —con-tor-tion-is-tic ad! con-tour (kôn'tôor) n. [Fr. < ltd. contono < contonare, to draw in outline : [at com (intensive) + Lat commare, to orund off < torms, lathe.] 1. a. The outline of a figure, body, or mass. 15. It line tornus, lathe.] L. a. The outline of a figure, body, or mass. b. A line representing such an outline. 2 often contours. A surface, esp. of a curving-form 3. A contour line. vi. toursed, cours ing. toursed.

1. To make or shape the outline of 2. To build (e.g., a road) to follow the contour of the land. add. 1. Following the contour lines of uneven terrain to reduce erosion of topsoil < contour plowing.

2. Shaped to fit the outline or form of something < a contour seat > contour feather n. One of the outermost feathers of a bird, forming the visible body contour and plumage.

contour line n A line, as on a contour map, joining points of contour map n A map showing contour lines

contour map n. A map showing contour lines.

contrained prof. [ME < Lat. < contra, against.] 1. Against : opposite contraining < contrained (the training state of the contraining < con belligerent by a neutral power. 4. An escaped slave who fled to or was taken behind Union lines during the Civil War. add. Barred from being imported or exported __con'traband'age n. __con'trab band'ist R

con tra base (kon'tr-bas) [Obs. Ital contrabasso : contra- Velow (< Lat. against) + basso, bass. Mus. n. A. double bass. add.
Pitched an octave below the normal bass range. com tra bass ist.
(-ba'sfat) n.

con-tra-bas-soon (kön'tra-bascon', ba-) n. The largest and lowest pitched of the double reed wind musical instruments, sounding an octave below the bassoon the date of the play are and a series and



in a captenging purton a commaniero (kon-ucilia) a "wieszt + jate, steen nius k. A.Pelskuighka contrali Contra bassoon SELECTIVE SALE roni solirinengualitara promosed on Statement of parts har erepréteux (kontrage

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Par Che : musverino : musecome & Lang con traception (kon'trasepshan) n. [CONTRASEPA] (CON)CEP ಪ್ರಕ್ಷ : attmos TION.] Prevention of conception con-tra-cep-tive (kon'tra-sep/tiv) adj. Capable of preventing conception. -con'tra-cep'tive n :

father te pet it ibe O paw, form